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CENSUS OF THE COMMONWEALTH OF AUSTRALIA.

30th June, 1947.

AUSTRALIAN LIFE TABLES, 1946-1948.

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Prepared by
WALTER C. BALMFORD, F.I.A.,
COMMONWEALTH ACTUARY.

18 OCT 1950

Published under instructions from
THE RIGHT HONORABLE THE TREASURER,
By
ROLAND WILSON, C.B.E., B.Com., D.Phil., Ph.D.,
COMMONWEALTH STATISTICIAN.

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REPORT ON THE AUSTRALIAN LIFE TABLES, 1946-1948 BY THE COMMONWEALTH ACTUARY.

It has been the practice, after each successive Census, to prepare Life Tables representative of the mortality experience of Australia. In continuation of this practice, the following Report deals with the construction of Life Tables based on the results of the 1947 Census. The new Tables form the sixth of the series.

2. The first three Life Tables for the whole of Australia were prepared under the direction of the Commonwealth Statistician and covered the decennial periods 1881–90, 1891–1900 and 1901–10. Tables based on the Census of 1921 were derived by the Commonwealth Statistician from the population recorded at that Census and the deaths in the three years 1920–22. In connexion with the 1933 Census the Life Tables, which were prepared by Mr. F. W. Barford, M.A., A.I.A., had regard to the deaths during the years 1932–34.

3. On this occasion the possible effect on the civilian population of conditions arising from the 1939–45 War rendered it undesirable to take into account deaths occurring prior to 1946, and the Life Tables have been based on the population recorded at the 1947 Census in conjunction with the deaths during 1946, 1947 and 1948. The Census was taken on the night of 30th June, 1947, and as the recorded population relates to the midpoint of the period 1st January, 1946, to 31st December, 1948, it may be assumed to represent the average population of the three years 1946 to 1948.

4. Throughout the investigation, except where specifically mentioned, the experience of males and females has been dealt with separately.

DATA.

5. The greater part of the data which have been used can be readily obtained from the official Report on the Census and the bulletins of Demography published annually. The Report on the Census had not been published when this investigation was instituted but the necessary data and such other needed information were furnished to me in advance of publication. The principal statistics employed are shown in Appendix C and consist of—

(*a*) the census population, male and female separately, at individual ages ;
(*b*) the deaths during 1946 to 1948, male and female separately, at individual ages ;
(*c*) the births between 1940 and 1948 ; and
(*d*) the deaths from 1941 to 1948, at ages under six years, subdivided in the case of deaths under one year of age during the last three years of the period, into deaths in each quarter of age.

The population comprised 3,797,370 males and 3,781,988 females and there were 124,707 male and 100,261 female deaths in the three years 1946 to 1948.

6. One rather unexpected feature of the Census was the large increase in the number of persons whose ages were not recorded. At the 1933 Census there were 10,188 males and 8,655 females of unknown ages out of a total population of 3,367,111 and 3,262,728 respectively. In June, 1947, the corresponding figures were 24,847 males among a population of 3,797,370 and 23,946 females among a population of 3,781,988. An examination of the data showed that the omissions had been largely confined to the population above school age and for the purpose of constructing the Life Tables, the numbers of unknown age were distributed proportionately among the population aged fifteen and over. The number of deaths of unknown age during 1946 to 1948 was not significant.

CONSTRUCTION OF THE LIFE TABLES.

7. *Mean Population.*—The assumption that the census population is a reasonable approximation to the true mean population may not be a valid one if the population has been subject to substantial fluctuations during the period under review. The proximity to the 1939–45 War, the inauguration of large scale migration shortly after the end of the War and the marked increase in the number of births in recent years, necessitated a careful examination, both in the aggregate and at individual ages, of the population movements which had taken place.

Regarding the first two features referred to above, the following factors have to be considered :—

(*a*) the small excess of emigration over immigration prior to 30th June, 1947 ;
(*b*) the increase in population due to immigration, after 30th June, 1947 ;
(*c*) the inclusion in the census population of a substantial number of members of the Defence Forces who returned from overseas between 1st January, 1946, and 30th June, 1947 ; and
(*d*) the inclusion in the Australian death statistics after 30th June, 1947, of deaths of members of the Defence Forces serving within Australia and the exclusion before that date of deaths of Defence personnel wherever serving.

An examination was made of the extent to which these factors would necessitate a correction of the census population in order to obtain a better approximation to the true mean population. This examination revealed that, for males, the addition to the census population to allow for migration operated in the opposite direction to, and was sufficient to minimize, the deduction to allow for the movement in Defence personnel. In the case of women, the effect of migration was not significant. I concluded that on the whole the various adjustments had no practical significance when applied to mortality rates calculated from the census population.

I am satisfied that it can be assumed, except at infantile ages where special processes have been employed, and at very advanced ages where the question of age misstatements becomes of major importance, that the population at the census date can be adopted as representing the mean population of the three-year period 1946 to 1948.

8. *King's Method.*—For the calculation of the rates of mortality applicable to the main span of ages I have used the method of the late George King, F.I.A., which has been adopted in England for all National Life Tables since 1911 and which was used for the construction of the Australian 1932–34 Tables. I have been led to this decision as the result of various considerations. The method has been proved to be particularly suitable for the computation of mortality rates from population statistics. It has been shown to produce smooth curves which adhere closely to the original data and it deals in a satisfactory manner with the presence of age misstatements in the census returns. In addition, as the mathematical calculations involved are not too complicated, the resulting mortality rates can be readily reproduced from the data included in Appendix C.

In conjunction with Mr. H. Vaughan, F.I.A., of Sydney, to whom I am grateful for helpful advice, I have examined other methods of constructing mortality tables from census data. These included a difference equation method and a summation method, both of which he himself had devised. I found that, over the greater period of life, the resulting mortality rates differed very little from those obtained by King's method and consequently felt loth to depart from a standard method which has been used so extensively in the past.

9. Briefly, King's method involves the grouping of the population and deaths in quinary age groups and the calculation of pivotal mortality rates applicable to the central age of each group. The intervening values are inserted by osculatory interpolation and special processes are used for early and advanced ages.

10. *Quinary Grouping.*—The selection of the quinary age grouping to be used is a matter of importance as the most reliable pivotal values will be obtained from that grouping in which the excess of numbers resulting from age misstatements at favoured ages is best counter-balanced by the deficiency in numbers at other ages. Exhaustive experiments were made to ascertain the grouping which would be most effective for this purpose. There is no really satisfactory method which will definitely determine the best grouping and a decision was obtained after an examination of the trend of the recorded population and deaths when aggregated according to the last digit of age.

Between ages 16 and 85 the numbers for five ages ending in a particular digit were aggregated. Thus the first aggregation was the sum of the population (or deaths) at ages 16, 26, 36, 46, 56 ; the second group was 17, 27, 37, 47, 57 ; and the last group was 45, 55, 65, 75, 85. The conclusions obtained from the resulting series were that, as regards the population, ages ending in the digits 0, 1 2 for males and 9, 0, 1, 2 for females should not be separated, whilst for deaths, ages ending in the digits 0, 1, 2 on the one hand and 5, 6, 7 on the other, should be combined. These conclusions indicated that the grouping of ages ending in digits 4 to 8 and 9 to 3, or 3 to 7 and 8 to 2 would most effectively eliminate the irregularities arising from age misstatements. On the whole, I preferred the former grouping and this was adopted.

11. By means of this grouping, pivotal values of the mean population and deaths in three years were obtained at ages 11, 16 . . . . . 86.

From these values the pivotal rates of mortality (q_x) at the same ages were obtained from the formula

$$q_x = \frac{\theta_x}{3\,P_x + \frac{1}{2}\,\theta_x},$$

where θ_x is the adjusted deaths in the three years, and P_x is the adjusted population, at the pivotal age x. King's osculatory interpolation process was applied to the function log (q_x + .1) to obtain a smoothly graduated series of mortality rates (q_x) for individual ages from 16 to 81. The function log (q_x + .1) was used because experiments showed that by its use a smoother progression was obtained than by operating directly on q_x

12. *Infantile Ages.*—The mortality rate changes rapidly over the first four or five years of life. The census figures for these ages may be subject to error not only because of age misstatements, as at older ages, but also because of omissions from the census returns. For these reasons a special method involving computation of infantile mortality rates directly from the records of births and deaths has been used. The method adopted is described in Appendix D, and the statistics from which the mortality rates were calculated are reproduced in Appendix C.

13. Before adopting this method for calculating the infantile mortality rates, it was considered desirable to examine the effect of certain approximations necessarily inherent in the formulae given in Appendix D. These were—

(i) the use of birth statistics tabulated according to the date of registration in spite of the fact that there is often a substantial interval between the actual date of birth and the date of registration, and

(ii) the assumption that the deaths are evenly spread over the quarter of age when it is known that this is not always so, especially during the first three months of life.

14. To measure the extent of any error arising through the use of birth registrations, arrangements were made for two samples to be extracted from the schedules of registrations. The years selected for the samples were 1944 and 1947 and the data were obtained by an examination of every third birth in the scheduled registrations for each State for the months of February, May, August and November in each of those years. There was only a very slight variation between the results of the two samples which indicated that, for the period under review—

56 per cent. of registrations in a month were born in that month.
41 per cent. of registrations in a month were born in the first month prior, and
3 per cent. of registrations in a month were born in the second month prior.

100 per cent.

This information enabled birth registrations to be redistributed according to the months in which, on the average, the births actually occurred. Two sets of mortality rates for the first five years of life were then calculated using for one set unadjusted births and, for the other, adjusted births.

No information could be obtained as to the delay in registration of deaths but it is to be presumed that any error here is not so serious as among the births.

15. The extent of the error involved in the assumption that deaths are evenly spread over the quarter of age was examined for the first year of life only. The examination was not carried to other infantile ages because it was obvious that at those ages any error would be negligible.

The procedure adopted was—

(*a*) By subdividing all the deaths under one month of age during the years 1946 to 1948, into deaths at ages 0–1 day, 1–2 days . . . . 6–7 days, 1–2 weeks, 2–3 weeks and 3–4 weeks, it was estimated that, after making a small allowance of between one and two days for the probable delay in registration of deaths, about 16 per cent. of the deaths in the first month of life, which were registered in a month, were derived from the births of the previous month.

(*b*) Because of the absence of any detailed subdivision it was necessarily assumed that of the deaths in a month at age 1–2 months, 50 per cent. were born in the previous month and the remainder in the month before that.

(*c*) For the same reason it was also assumed that of the deaths in a month at age 2–3 months, 50 per cent. were born in the previous month but one and the remainder in the month before that.

(*d*) By applying to the proportions at (*a*), (*b*) and (*c*) weights derived from the deaths during 1946 to 1948 in the first, second and third months of life, it was estimated that of the deaths aged 0–3 months in a quarter, 11 per cent. could, on the average, be allocated to the births of the previous quarter.

(*e*) Somewhat similar processes were adopted for the deaths at ages 3–6 months, 6–9 months and 9–12 months. The results indicated that of the deaths at age 3–6 months, in a quarter, 55 per cent. arose from births in the preceding quarter and 45 per cent. in the quarter before that. The indications were that 50 per cent. of the deaths at ages 6–9 months and 9–12 months in a quarter could be related to the births in each of the appropriate quarters.

16. As pointed out in paragraph 13 the formulae in Appendix D assume that deaths are evenly spread over the quarter of age. It follows that the proportion of deaths at age 0–3 months in a quarter, which relate to births in the previous quarter, is assumed to be one-half. As a result, one-half of the births in the fourth quarter of 1945 are brought into the formula for $q^{0\text{–}3 \text{ months}}$ and one-half of the births in the fourth quarter of 1948 are deducted. The conclusion obtained in paragraph 15 (*d*) is, however, that the adjustment should be of the order of one-ninth instead of one-half.

The small alteration which could have been made to the proportions of births in the third quarters of 1945 and 1948 included in the formula for $q^{2\text{–}3 \text{ months}}$ had no effect on the mortality rate. No adjustment was needed to the formulae for the mortality rates in the second six months of life.

17. The adjustments referred to in paragraphs 14 and 16 would reduce the rate of mortality in the first year of life by .00015. As this adjustment is itself dependent on certain assumptions and as it is small in relation to the rate of mortality in the first year of life, I decided to retain the mortality rates based on the formulae in Appendix D. The figure may, however, be regarded as an approximation to the value of the error arising from the two assumptions which have been examined.

18. *Ages 6 to 15.*—By the methods described in the previous paragraphs mortality rates had been obtained for ages 0 to 5, for ages 16, 17 and onwards, together with a pivotal rate at age 11. It remained to insert the intermediate values. For this purpose, in the case of males, a fourth difference formula based on the mortality rates for ages 4, 5, 11, 16 and 17 was used to obtain intervening values. Comparison of the expected deaths produced by these rates with the deaths which had actually occurred showed however, that the pivotal value at age 11 had been placed too low. The reason appeared to be that the rapid fall in the number of deaths at earlier ages had an undue effect on the number of adjusted deaths at pivotal age 11. The crude mortality rate for the age group 9 to 13 appeared to give a better value for age 11 and this was finally adopted in the fourth difference formula.

For females, a similar formula was used. An adjustment at age 11 was not considered necessary as the feature which caused the difficulty in connexion with the male rates was not so pronounced for females.

19. *Ages 87 to 104.*—Previous Australian National Tables have arbitrarily assumed a mortality rate of unity at age 104 and, in 1933, proceeded to insert the intermediate values from age 88 by interpolatory processes. Such an assumption for the present Tables would have produced unjustifiably high mortality rates at the advanced ages. Moreover, I am unable to accept the assumption that the mortality rate can be fixed at unity at any particular age.

The data at advanced ages are meagre and an examination of the average values of the central mortality rate (m_x) for the age groups 79–83, 84–88, 89–93 and 94–98, as shown in the following table—in particular the ratios in columns (2) and (4)—leads to the conclusion that the age statements at the Census, or on death, amongst people over age 90 are completely unreliable. There appears to have been, if anything, an over-statement of the number of people aged 94 or more.

CENTRAL MORTALITY RATES.

Age Group.	Males.		Females.	
	m_x	$\frac{m_{x+5}}{m_x}$	m_x	$\frac{m_{x+5}}{m_x}$
	(1)	(2)	(3)	(4)
79–83	.1369	1.56	.1147	1.59
84–88	.2138	1.51	.1828	1.54
89–93	.3218	1.27	.2806	1.29
94–98	.4083	..	.3624	..

It was considered unwise to place much reliance on the pivotal mortality rate at age 91 and the data were too small to enable a pivotal value for age 96 to be calculated. The mortality rates from age 87 onwards were therefore completed by means of a Gompertz formula. The criterion adopted for the Gompertz formula was that the total expected deaths after age 83 should agree closely with the total actual deaths after that age. Experiments indicated that the most satisfactory values of—

$$r \left(\text{i.e. } \frac{\text{colog } p_{x+5}}{\text{colog } p_x} \right)$$

were 1.51 for males and 1.54 for females.

In order to obtain a satisfactory junction between the mortality rates up to age 81 and those from age 86 onwards, the rates between these ages were derived by osculatory interpolation using the pivotal rates at ages 76, 81 and 86 and the amended rate for age 91.

COMPARISON OF ACTUAL AND EXPECTED DEATHS.

20. In the next Table the graduated mortality rates have been tested by comparing the deaths actually recorded in the years 1946 to 1948 with the expected deaths computed on the basis of the graduated mortality rates and the census population. For this purpose, as the population is given according to age last birthday, the mortality rates (q_x) were converted to central mortality rates (m_x) by the formula—

$$m_x = \frac{2\,q_x}{2 - q_x}$$

This formula becomes unreliable after about age 80 because of the rapid increase in mortality rates at high ages and for these ages the formula used was—

$$m_x = \frac{2\,q_x}{2 - q_x - \frac{1}{12}\left(\frac{q_{x-1}}{p_{x-1}} - q_{x+1} \cdot p_x\right)}$$

The calculation of the number of expected deaths was made at individual ages but the results have been aggregated in seven-year age groups in order to avoid any bias which might arise from the adoption of the grouping used for the calculation of pivotal values. The Table does not include the comparison for ages 0 to 5 because the mortality rates at these ages have been obtained directly from the records of births and deaths.

COMPARISON OF ACTUAL AND EXPECTED DEATHS.

Age Group.	Males.					Females.				
	Actual Deaths.	Expected Deaths.	Deviation. +	Deviation. −	Accumulated Deviation.	Actual Deaths.	Expected Deaths.	Deviation. +	Deviation. −	Accumulated Deviation.
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
6–12 ..	1,001	968	33	..	+33	666	648	18	..	+18
13–19 ..	1,519	1,542	..	23	+10	766	792	..	26	−8
20–26 ..	2,213	2,207	6	..	+16	1,550	1,521	29	..	+21
27–33 ..	2,311	2,300	11	..	+27	2,064	2,089	..	25	−4
34–40 ..	3,219	3,211	8	..	+35	2,765	2,784	..	19	−23
41–47 ..	5,320	5,413	..	93	−58	3,828	3,829	..	1	−24
48–54 ..	9,240	9,101	139	..	+81	6,407	6,338	69	..	+45
55–61 ..	15,424	15,517	..	93	−12	9,266	9,356	..	90	−45
62–68 ..	20,127	20,093	34	..	+22	13,098	13,070	28	..	−17
69–75 ..	20,797	20,811	..	14	+8	17,082	17,067	15	..	−2
76–82 ..	19,418	19,431	..	13	−5	18,738	18,650	88	..	+86
83–89 ..	11,082	11,012	70	..	+65	12,727	12,727	..	..	+86
90–96 ..	2,060	2,104	..	44	+21	2,950	3,009	..	59	+27
97–104 ..	148	188	..	40	−19	235	275	..	40	−13
Total ..	113,879	113,898	301	320	−19	92,142	92,155	247	260	−13

It will be observed that for both males and females the differences between the actual and expected deaths are small, they change sign frequently and the accumulated deviations are not significant. Owing to the fact that the data are not free of bias as regards the recorded ages, no authority could be claimed for more refined tests based on a detailed examination of the size of the deviations between actual and expected deaths. On the whole it would appear that the graduated rates of mortality reflect closely the mortality experience of the three years under review.

LIFE TABLES AND TABULATED FUNCTIONS.

21. The complete Life Tables for males and females are given in Appendix A. The functions tabulated are—

l_x = the number of persons surviving at exact age x;

d_x = the number of deaths in the year of age x to $x + 1$ among the l_x persons who enter on that year;

p_x = the probability of a person aged x living a year;

q_x = the probability of a person aged x dying within a year;

μ_x = the nominal annual rate of mortality based on the assumption that the intensity of mortality during the moment following the attainment of age x continues throughout the year of age x to $x + 1$;

$\mathring{e}_x$ = the "complete expectation of life" or the average number of years lived after age x by each of a group of persons aged exactly x.

The formulae adopted for the calculation of the last two functions were as follows:—

$$\mu_x = \frac{1}{l_x}\left[7\ (d_{x-1} + d_x) - (d_{x-2} + d_{x+1})\right]$$

$$\mathring{e}_x = \frac{\sum_{t=1}^{\omega} l_{x+t}}{l_x} + \tfrac{1}{2} - \tfrac{1}{12}\ \mu_x.$$

EXAMINATION OF THE MORTALITY RATES.

22. An examination of the mortality rates reveals several features which require comment. The rates for ages 0 to 5 have been calculated by the special processes described in Appendix D and have not been graduated. Nevertheless they run smoothly and merge satisfactorily with the rates for higher ages. The rates for males at these ages are, with the exception of age 1, approximately 30 per cent. to 35 per cent. heavier than the corresponding female rates. For age 1, the male rate is only 10 per cent. heavier. There is no apparent explanation for this feature.

The graduated rates of mortality for males show a maximum at age 22 followed by a decline to ages 25 and 26 where a minimum occurs. Thereafter the rates increase steadily with age. This decrease in mortality rates does not occur amongst females although there is some slackening in the progression of the rates about these ages. The rates for males in the early twenty's appear to be largely dependent on the number of deaths by accident. Deaths from this cause in the age group 20 to 24 were particularly heavy in the three years 1946 to 1948 and this has had the effect of increasing mortality rates in the early twenty's. The effect of the method of graduation has been to create a peak in the middle of the age group 19 to 23.

23. A comparison of the new National Tables with the Tables for earlier periods is made in Appendix B under the following headings:—

Table 1.—The rates of mortality (q_x) at selected ages;

Table 2.—Rates of mortality for one period as a proportion of the rates for the preceding period;

Table 3.—The number of survivors (l_x) at selected ages out of 100,000 births;

Table 4.—The complete expectation of life ($\mathring{e}_x$) at selected ages;

Table 5.—The probability of surviving ten years ($_{10}p_x$) at selected ages.

24. The main characteristics of the Life Tables in Appendix A and the conclusions to be drawn from the comparative Tables in Appendix B are—

(*a*) A further substantial reduction has occurred in the mortality rates in the first year of life;

(*b*) A further marked improvement is evident in the vitality of both males and females up to about age 40;

(*c*) A less pronounced improvement is shown in the mortality rates of both sexes between ages 40 and 80; indeed, in the case of males, the rates between ages 60 and 80 are generally in excess of those recorded in the 1932–34 Tables;

(*d*) Because of the different methods of graduation, referred to in paragraph 19, no valid conclusions can be drawn from comparative tables as to the trend in mortality rates from age 80 onwards; the indications are however that, if the methods of graduation had been the same, the new mortality rates for males would have been somewhat higher than, and those for females approximately equivalent to, the mortality rates derived from the 1933 Census;

(*e*) Although the 1932–34 Tables disclosed that the mortality rates of females at the child-bearing ages close to age 30 were slightly in excess of the rates for males at the same ages, the differences in the rates on this occasion are slightly in favour of the females ;

(*f*) The mortality rates for females are lighter than those for males at all ages ;

(*g*) On the whole the vitality of the female population shows a greater degree of improvement over the last fourteen years than does that of the males.

WALTER C. BALMFORD,
Commonwealth Actuary.

18th April, 1950.

APPENDIX A.

1. AUSTRALIAN LIFE TABLE, 1946–1948.

A^{M47} A^{M47}

MALES.

Age x	l_x	d_x	p_x	q_x	μ_x	$\mathring{e}_x$	Age x	l_x	d_x	p_x	q_x	μ_x	$\mathring{e}_x$
0	100,000	3,199	.96801	.03199	..	66.07	55	81,216	1,202	.98520	.01480	.01423	18.84
1	96,801	317	.99673	.00327	..	67.25	56	80,014	1,296	.98380	.01620	.01560	18.11
2	96,484	190	.99803	.00197	..	66.47	57	78,718	1,392	.98232	.01768	.01707	17.40
3	96,294	141	.99854	.00146	.00163	65.60	58	77,326	1,488	.98076	.01924	.01862	16.71
4	96,153	116	.99879	.00121	.00131	64.70	59	75,838	1,587	.97907	.02093	.02026	16.02
5	96,037	103	.99893	.00107	.00113	63.77	60	74,251	1,691	.97722	.02278	.02206	15.36
6	95,934	90	.99906	.00094	.00100	62.84	61	72,560	1,802	.97517	.02483	.02405	14.70
7	95,844	81	.99916	.00084	.00089	61.90	62	70,758	1,919	.97288	.02712	.02628	14.06
8	95,763	74	.99923	.00077	.00080	60.95	63	68,839	2,040	.97037	.02963	.02875	13.44
9	95,689	70	.99927	.00073	.00075	60.00	64	66,799	2,160	.96766	.03234	.03144	12.84
10	95,619	69	.99928	.00072	.00072	59.04	65	64,639	2,279	.96475	.03525	.03435	12.25
11	95,550	72	.99925	.00075	.00073	58.08	66	62,360	2,391	.96166	.03834	.03747	11.68
12	95,478	78	.99918	.00082	.00078	57.13	67	59,969	2,492	.95844	.04156	.04074	11.12
13	95,400	87	.99909	.00091	.00086	56.17	68	57,477	2,582	.95508	.04492	.04417	10.58
14	95,313	97	.99898	.00102	.00096	55.22	69	54,895	2,665	.95145	.04855	.04781	10.06
15	95,216	109	.99885	.00115	.00108	54.28	70	52,230	2,745	.94744	.05256	.05179	9.55
16	95,107	121	.99873	.00127	.00121	53.34	71	49,485	2,825	.94291	.05709	.05628	9.05
17	94,986	131	.99862	.00138	.00133	52.41	72	46,660	2,906	.93772	.06228	.06142	8.57
18	94,855	141	.99851	.00149	.00143	51.48	73	43,754	2,980	.93189	.06811	.06731	8.10
19	94,714	152	.99840	.00160	.00155	50.56	74	40,774	3,036	.92553	.07447	.07386	7.66
20	94,562	160	.99831	.00169	.00166	49.64	75	37,738	3,067	.91874	.08126	.08099	7.23
21	94,402	164	.99826	.00174	.00172	48.72	76	34,671	3,063	.91165	.08835	.08858	6.83
22	94,238	165	.99825	.00175	.00175	47.80	77	31,608	3,022	.90439	.09561	.09644	6.44
23	94,073	162	.99828	.00172	.00174	46.89	78	28,586	2,949	.89683	.10317	.10460	6.07
24	93,911	157	.99833	.00167	.00170	45.97	79	25,637	2,852	.88875	.11125	.11327	5.71
25	93,754	153	.99837	.00163	.00165	45.04	80	22,785	2,737	.87989	.12011	.12277	5.36
26	93,601	153	.99837	.00163	.00163	44.12	81	20,048	2,607	.86995	.13005	.13338	5.03
27	93,448	155	.99834	.00166	.00164	43.19	82	17,441	2,467	.85854	.14146	.14559	4.70
28	93,293	160	.99829	.00171	.00168	42.26	83	14,974	2,311	.84566	.15434	.15975	4.40
29	93,133	166	.99822	.00178	.00175	41.33	84	12,663	2,133	.83158	.16842	.17578	4.11
30	92,967	173	.99814	.00186	.00182	40.40	85	10,530	1,930	.81668	.18332	.19327	3.84
31	92,794	180	.99806	.00194	.00190	39.48	86	8,600	1,708	.80138	.19862	.21182	3.59
32	92,614	186	.99799	.00201	.00198	38.55	87	6,892	1,473	.78628	.21372	.23085	3.36
33	92,428	192	.99792	.00208	.00204	37.63	88	5,419	1,245	.77021	.22979	.25048	3.15
34	92,236	200	.99783	.00217	.00212	36.71	89	4,174	1,030	.75313	.24687	.27190	2.94
35	92,036	210	.99772	.00228	.00222	35.79	90	3,144	833	.73500	.26500	.29524	2.74
36	91,826	223	.99757	.00243	.00235	34.87	91	2,311	657	.71581	.28419	.32078	2.56
37	91,603	240	.99738	.00262	.00252	33.95	92	1,654	504	.69555	.30445	.34861	2.39
38	91,363	259	.99717	.00283	.00273	33.04	93	1,150	374.7	.67419	.32581	.37854	2.23
39	91,104	281	.99692	.00308	.00296	32.13	94	775.3	270.0	.65173	.34827	.41070	2.07
40	90,823	306	.99663	.00337	.00322	31.23	95	505.3	187.9	.62820	.37180	.44607	1.93
41	90,517	336	.99629	.00371	.00354	30.33	96	317.4	125.8	.60360	.39640	.48440	1.80
42	90,181	369	.99591	.00409	.00390	29.44	97	191.6	80.9	.57798	.42202	.52597	1.67
43	89,812	406	.99548	.00452	.00431	28.56	98	110.7	49.7	.55138	.44862	.57167	1.55
44	89,406	447	.99500	.00500	.00476	27.69	99	61.0	29.0	.52389	.47611	.62008	1.44
45	88,959	493	.99446	.00554	.00527	26.83	100	32.0	16.1	.49559	.50441	..	..
46	88,466	543	.99386	.00614	.00585	25.97	101	15.9	8.5	.46658	.53342	..	..
47	87,923	598	.99320	.00680	.00648	25.13	102	7.4	4.2	.43701	.56299	..	..
48	87,325	658	.99247	.00753	.00718	24.30	103	3.2	1.9	.40701	.59299	..	..
49	86,667	721	.99168	.00832	.00795	23.48	104	1.3	.8	.37676	.62324	..	..
50	85,946	790	.99081	.00919	.00878	22.67	105	.5	.3	.34645	.65355	..	..
51	85,156	863	.98986	.01014	.00970	21.88							
52	84,293	942	.98883	.01117	.01070	21.10							
53	83,351	1,024	.98771	.01229	.01179	20.33							
54	82,327	1,111	.98650	.01350	.01296	19.58							

A F47

2. AUSTRALIAN LIFE TABLE, 1946–1948.

FEMALES.

A F47

Age x	l_x	d_x	p_x	q_x	μ_x	$\mathring{e}_x$	Age x	l_x	d_x	p_x	q_x	μ_x	$\mathring{e}_x$
0	100,000	2,519	.97481	.02519	..	70.63	55	85,743	779	.99092	.00908	.00880	22.04
1	97,481	289	.99704	.00296	..	71.45	56	84,964	832	.99021	.00979	.00947	21.24
2	97,192	144	.99852	.00148	..	70.66	57	84,132	892	.98940	.01060	.01023	20.44
3	97,048	106	.99891	.00109	.00118	69.77	58	83,240	956	.98851	.01149	.01109	19.65
4	96,942	91	.99906	.00094	.00100	68.84	59	82,284	1,027	.98752	.01248	.01204	18.88
5	96,851	77	.99921	.00079	.00086	67.91	60	81,257	1,105	.98640	.01360	.01310	18.11
6	96,774	66	.99932	.00068	.00073	66.96	61	80,152	1,192	.98513	.01487	.01431	17.35
7	96,708	58	.99940	.00060	.00064	66.01	62	78,960	1,284	.98374	.01626	.01567	16.61
8	96,650	52	.99946	.00054	.00056	65.04	63	77,676	1,379	.98225	.01775	.01713	15.87
9	96,598	49	.99949	.00051	.00052	64.08	64	76,297	1,481	.98059	.01941	.01872	15.15
10	96,549	48	.99950	.00050	.00050	63.11	65	74,816	1,596	.97867	.02133	.02053	14.44
11	96,501	48	.99950	.00050	.00050	62.14	66	73,220	1,727	.97642	.02358	.02266	13.74
12	96,453	49	.99949	.00051	.00050	61.17	67	71,493	1,873	.97380	.02620	.02515	13.06
13	96,404	52	.99946	.00054	.00052	60.20	68	69,620	2,029	.97085	.02915	.02800	12.40
14	96,352	55	.99943	.00057	.00055	59.24	69	67,591	2,193	.96755	.03245	.03122	11.76
15	96,297	59	.99939	.00061	.00059	58.27	70	65,398	2,359	.96393	.03607	.03480	11.14
16	96,238	63	.99935	.00065	.00063	57.31	71	63,039	2,523	.95997	.04003	.03873	10.53
17	96,175	67	.99930	.00070	.00067	56.34	72	60,516	2,680	.95571	.04429	.04301	9.95
18	96,108	74	.99923	.00077	.00073	55.38	73	57,836	2,827	.95112	.04888	.04763	9.39
19	96,034	81	.99916	.00084	.00081	54.42	74	55,009	2,966	.94608	.05392	.05268	8.85
20	95,953	87	.99909	.00091	.00087	53.47	75	52,043	3,099	.94046	.05954	.05829	8.32
21	95,866	95	.99901	.00099	.00095	52.52	76	48,944	3,225	.93411	.06589	.06463	7.82
22	95,771	102	.99893	.00107	.00103	51.57	77	45,719	3,345	.92683	.07317	.07189	7.33
23	95,669	111	.99884	.00116	.00111	50.62	78	42,374	3,450	.91858	.08142	.08027	6.87
24	95,558	119	.99875	.00125	.00120	49.68	79	38,924	3,523	.90949	.09051	.08974	6.44
25	95,439	127	.99867	.00133	.00129	48.74	80	35,401	3,550	.89973	.10027	.10014	6.02
26	95,312	134	.99859	.00141	.00137	47.81	81	31,851	3,520	.88949	.11051	.11127	5.64
27	95,178	141	.99852	.00148	.00145	46.88	82	28,331	3,437	.87870	.12130	.12307	5.28
28	95,037	146	.99846	.00154	.00151	45.94	83	24,894	3,307	.86714	.13286	.13576	4.94
29	94,891	151	.99841	.00159	.00156	45.01	84	21,587	3,134	.85483	.14517	.14952	4.62
30	94,740	156	.99835	.00165	.00162	44.08	85	18,453	2,919	.84182	.15818	.16435	4.32
31	94,584	163	.99828	.00172	.00168	43.16	86	15,534	2,670	.82815	.17185	.18024	4.04
32	94,421	171	.99819	.00181	.00177	42.23	87	12,864	2,390	.81418	.18582	.19692	3.78
33	94,250	180	.99809	.00191	.00186	41.31	88	10,474	2,103	.79923	.20077	.21455	3.53
34	94,070	190	.99798	.00202	.00196	40.38	89	8,371	1,815	.78323	.21677	.23397	3.30
35	93,880	201	.99786	.00214	.00208	39.46	90	6,556	1,533	.76616	.23384	.25507	3.08
36	93,679	213	.99773	.00227	.00221	38.55	91	5,023	1,266	.74798	.25202	.27804	2.86
37	93,466	224	.99760	.00240	.00234	37.64	92	3,757	1,019	.72865	.27135	.30306	2.67
38	93,242	236	.99747	.00253	.00247	36.72	93	2,738	799	.70814	.29186	.33029	2.48
39	93,006	248	.99733	.00267	.00260	35.82	94	1,939	608	.68644	.31356	.36025	2.31
40	92,758	263	.99716	.00284	.00275	34.91	95	1,331	447.8	.66353	.33647	.39276	2.14
41	92,495	281	.99696	.00304	.00294	34.01	96	883.2	318.5	.63943	.36057	.42820	1.99
42	92,214	301	.99674	.00326	.00315	33.11	97	564.7	217.9	.61414	.38586	.46691	1.84
43	91,913	323	.99649	.00351	.00339	32.22	98	346.8	143.0	.58772	.41228	.50899	1.71
44	91,590	347	.99621	.00379	.00365	31.33	99	203.8	89.6	.56021	.43979	.55479	1.58
45	91,243	375	.99589	.00411	.00395	30.45	100	114.2	53.5	.53168	.46832	..	..
46	90,868	406	.99553	.00447	.00429	29.57	101	60.7	30.2	.50224	.49776	..	
47	90,462	442	.99511	.00489	.00468	28.70	102	30.5	16.1	.47199	.52801	..	
48	90,020	483	.99463	.00537	.00513	27.84	103	14.4	8.0	.44108	.55892	..	..
49	89,537	526	.99412	.00588	.00563	26.99	104	6.4	3.8	.40969	.59031	..	..
50	89,011	571	.99359	.00641	.00616	26.14	105	2.6	1.6	.37802	.62198	..	..
51	88,440	615	.99305	.00695	.00671	25.31	106	1.0	.7	.34626	.65374	..	..
52	87,825	655	.99254	.00746	.00724	24.48	107	.3	.2	.31467	.68533	..	..
53	87,170	694	.99204	.00796	.00774	23.66							
54	86,476	733	.99152	.00848	.00824	22.85							

APPENDIX B.

COMPARATIVE TABLES.

1. Rates of Mortality (q_x) at Selected Ages.

Age. (x)	Males.			Females.		
	1920–22.	1932–34.	1946–48.	1920–22.	1932–34.	1946–48.
	(1)	(2)	(3)	(4)	(5)	(6)
0	.07132	.04543	.03199	.05568	.03642	.02519
10	.00156	.00119	.00072	.00127	.00087	.00050
20	.00284	.00219	.00169	.00252	.00183	.00091
30	.00390	.00271	.00186	.00387	.00279	.00165
40	.00617	.00460	.00337	.00524	.00402	.00284
50	.01158	.00966	.00919	.00808	.00744	.00641
60	.02407	.02216	.02278	.01571	.01466	.01360
70	.05290	.05082	.05256	.04090	.03802	.03607
80	.13340	.12659	.12011	.11230	.10106	.10027

2. Rates of Mortality for One Period as a Proportion of the Rates for the Preceding Period.

Age.	Males.		Females.	
	1932–34 / 1920–22.	1946–48 / 1932–34.	1932–34 / 1920–22.	1946–48 / 1932–34.
	(1)	(2)	(3)	(4)
0	.64	.70	.65	.69
10	.76	.61	.69	.57
20	.77	.77	.73	.50
30	.69	.69	.72	.59
40	.75	.73	.77	.71
50	.83	.95	.92	.86
60	.92	1.03	.93	.93
70	.96	1.03	.93	.95
80	.95	.95	.90	.99

3. Number of Survivors (l_x) at Selected Ages out of 100,000 Births.

Age (x).	Males.			Females.		
	1920–22.	1932–34.	1946–48.	1920–22.	1932–34.	1946–48.
0	100,000	100,000	100,000	100,000	100,000	100,000
10	89,389	93,193	95,619	91,314	94,424	96,549
20	87,697	91,797	94,562	89,906	93,341	95,953
30	84,743	89,566	92,967	87,086	91,174	94,740
40	80,813	86,539	90,823	83,279	88,175	92,758
50	74,330	81,061	95,946	78,313	83,680	89,011
60	63,386	69,950	74,251	70,150	75,565	81,257
70	44,332	50,086	52,230	54,771	59,629	65,398
80	18,614	22,223	22,785	27,170	31,539	35,401

4. Complete Expectation of Life ($\mathring{e}_x$) at Selected Ages.

Age (x).	Males.			Females.		
	1920–22.	1932–34.	1946–48.	1920–22.	1932–34.	1946–48.
0	59.15	63.48	66.07	63.31	67.14	70.63
10	56.01	58.02	59.04	59.20	61.02	63.11
20	46.99	48.81	49.64	50.03	51.67	53.47
30	38.44	39.90	40.40	41.48	42.77	44.08
40	30.05	31.11	31.23	33.14	34.04	34.91
50	22.20	22.83	22.67	24.90	25.58	26.14
60	15.08	15.57	15.36	17.17	17.74	18.11
70	9.26	9.60	9.55	10.41	10.98	11.14

5. Probability of Surviving Ten Years ($_{10}p_x$) at Selected Ages.

Age (x).	Males.			Females.		
	1920–22.	1932–34.	1946–48.	1920–22.	1932–34.	1946–48.
0	.89389	.93193	.95619	.91314	.94424	.96549
10	.98107	.98502	.98895	.98458	.98853	.99383
20	.96632	.97570	.98313	.96863	.97678	.98736
30	.95362	.96620	.97694	.95628	.96711	.97908
40	.91978	.93670	.94630	.94037	.94902	.95960
50	.85276	.86293	.86393	.89576	.90302	.91289
60	.69940	.71603	.70342	.78077	.78911	.80483
70	.41988	.44370	.43624	.49607	.52892	.54132

APPENDIX C.

1. POPULATION AT CENSUS, 30TH JUNE, 1947, AND DEATHS IN THREE YEARS, 1946–48, AUSTRALIA.

MALES.

Age Last Birthday.	Population.	Deaths.	Age Last Birthday.	Population.	Deaths.
	(1)	(2)		(3)	(4)
0 ..	93,735	8,755	55 ..	38,947	1,711
1 ..	75,699	823	56 ..	40,936	1,958
2 ..	78,024	460	57 ..	39,831	2,074
3 ..	74,643	323	58 ..	40,403	2,392
4 ..	66,200	255	59 ..	38,811	2,422
5 ..	67,916	212	60 ..	36,768	2,539
6 ..	62,375	195	61 ..	30,224	2,328
7 ..	59,931	170	62 ..	32,508	2,687
8 ..	59,438	126	63 ..	31,100	2,797
9 ..	58,037	145	64 ..	28,557	2,797
10 ..	57,589	107	65 ..	27,515	3,058
11 ..	54,772	123	66 ..	24,384	2,728
12 ..	53,039	135	67 ..	23,987	2,989
13 ..	52,787	112	68 ..	21,139	3,071
14 ..	53,574	150	69 ..	19,486	2,986
15 ..	55,777	172	70 ..	18,581	3,094
16 ..	58,620	247	71 ..	15,123	2,578
17 ..	59,576	247	72 ..	15,802	2,945
18 ..	61,581	287	73 ..	14,104	2,977
19 ..	61,970	304	74 ..	13,309	3,104
20 ..	59,340	325	75 ..	12,237	3,113
21 ..	62,987	320	76 ..	11,571	3,107
22 ..	61,928	313	77 ..	10,483	3,106
23 ..	62,247	334	78 ..	8,820	3,050
24 ..	62,988	303	79 ..	7,803	2,846
25 ..	62,818	325	80 ..	7,233	2,658
26 ..	62,910	293	81 ..	5,474	2,279
27 ..	58,610	292	82 ..	5,188	2,372
28 ..	56,114	291	83 ..	4,587	2,287
29 ..	57,045	314	84 ..	3,736	2,145
30 ..	60,064	303	85 ..	3,021	1,838
31 ..	56,358	353	86 ..	2,488	1,699
32 ..	61,477	367	87 ..	1,953	1,269
33 ..	61,002	391	88 ..	1,223	1,015
34 ..	58,630	387	89 ..	942	829
35 ..	58,158	388	90 ..	672	615
36 ..	58,484	394	91 ..	442	456
37 ..	56,970	454	92 ..	335	374
38 ..	56,034	504	93 ..	230	256
39 ..	55,663	531	94 ..	136	178
40 ..	55,882	561	95 ..	91	103
41 ..	50,656	612	96 ..	71	78
42 ..	53,480	654	97 ..	41	50
43 ..	51,239	647	98 ..	30	43
44 ..	46,751	717	99 ..	19	24
45 ..	48,595	839	100 and over	15	31
46 ..	50,488	896			
47 ..	51,178	955			
48 ..	43,096	1,053			
49 ..	43,024	1,075	Total ..	3,797,370	124,707
50 ..	43,588	1,174			
51 ..	38,424	1,209			
52 ..	42,010	1,477			
53 ..	42,131	1,491			
54 ..	41,362	1,761			

2. POPULATION AT CENSUS, 30TH JUNE, 1947, AND DEATHS IN THREE YEARS, 1946–48, AUSTRALIA.

FEMALES.

Age Last Birthday.	Population.	Deaths.	Age Last Birthday.	Population.	Deaths.
	(1)	(2)		(3)	(4)
0 ..	89,179	6,505	55 ..	39,940	1,019
1 ..	71,487	710	56 ..	41,174	1,264
2 ..	75,307	331	57 ..	39,537	1,183
3 ..	72,374	232	58 ..	39,793	1,429
4 ..	63,739	191	59 ..	38,077	1,470
5 ..	65,250	150	60 ..	39,312	1,513
6 ..	60,063	124	61 ..	30,135	1,388
7 ..	57,770	128	62 ..	33,309	1,688
8 ..	57,591	74	63 ..	32,346	1,741
9 ..	55,612	96	64 ..	29,450	1,830
10 ..	55,792	80	65 ..	29,378	1,978
11 ..	53,002	78	66 ..	26,602	1,821
12 ..	51,799	86	67 ..	26,043	1,914
13 ..	50,890	73	68 ..	23,481	2,126
14 ..	51,439	91	69 ..	21,359	2,188
15 ..	53,594	91	70 ..	22,150	2,376
16 ..	57,167	113	71 ..	16,881	2,016
17 ..	57,587	100	72 ..	18,141	2,449
18 ..	59,610	152	73 ..	17,119	2,639
19 ..	61,184	146	74 ..	16,190	2,693
20 ..	59,917	165	75 ..	14,740	2,721
21 ..	61,697	173	76 ..	13,796	2,822
22 ..	62,000	203	77 ..	12,308	2,647
23 ..	61,775	225	78 ..	10,757	2,874
24 ..	63,075	233	79 ..	9,478	2,779
25 ..	63,678	277	80 ..	8,933	2,739
26 ..	63,548	274	81 ..	6,444	2,336
27 ..	58,840	239	82 ..	6,453	2,541
28 ..	57,146	271	83 ..	5,895	2,412
29 ..	57,677	295	84 ..	4,971	2,382
30 ..	61,955	299	85 ..	4,080	2,076
31 ..	56,420	267	86 ..	3,380	1,966
32 ..	62,442	343	87 ..	2,602	1,502
33 ..	61,516	350	88 ..	1,863	1,342
34 ..	58,234	349	89 ..	1,376	1,047
35 ..	58,031	359	90 ..	1,100	879
36 ..	56,469	393	91 ..	658	611
37 ..	54,458	387	92 ..	548	517
38 ..	54,256	433	93 ..	382	367
39 ..	52,423	401	94 ..	250	268
40 ..	52,704	443	95 ..	169	176
41 ..	45,526	445	96 ..	118	132
42 ..	49,768	479	97 ..	83	96
43 ..	47,021	505	98 ..	46	52
44 ..	43,265	482	99 ..	23	46
45 ..	45,313	550	100 and over	21	41
46 ..	47,693	655			
47 ..	49,976	712			
48 ..	43,122	706			
49 ..	43,243	717	Total ..	3,781,988	100,261
50 ..	46,624	837			
51 ..	39,257	884			
52 ..	44,150	1,020			
53 ..	44,266	1,099			
54 ..	43,176	1,144			

3. BIRTHS REGISTERED IN AUSTRALIA DURING EACH QUARTER, 1940–48.

Quarter of Year.	1940.	1941.	1942.	1943.	1944.	1945.	1946.	1947.	1948.
Males.									
First	15,811	16,375	17,905	17,660	19,857	21,187	19,997	25,005	22,462
Second	15,542	16,551	18,120	18,027	19,275	21,207	20,359	23,430	23,095
Third	16,711	17,655	17,752	20,812	19,542	20,008	23,834	23,059	22,726
Fourth..	16,531	18,380	16,450	19,854	19,668	20,055	26,778	22,324	23,028
Total	64,595	68,961	70,227	76,353	78,342	82,457	90,968	93,818	91,311
Females.									
First	15,177	15,606	16,716	16,761	19,040	19,940	18,781	23,511	21,185
Second	14,777	15,669	17,218	17,139	18,213	20,311	18,955	22,053	21,882
Third	15,916	16,861	17,067	19,855	18,836	19,100	22,437	21,985	21,629
Fourth..	15,882	17,428	15,480	19,187	18,913	18,752	25,238	21,017	21,969
Total	61,752	65,564	66,481	72,942	75,002	78,103	85,411	88,566	86,665

4. DEATHS UNDER SIX YEARS OF AGE REGISTERED IN AUSTRALIA, 1941–48.

Year.	0–3 months.	3–6 months.	6–9 months.	9 months–1 year.	Total 0–1 year.	1–2 years.	2–3 years.	3–4 years.	4–5 years.	5–6 years.
Males.										
1941 ..	..	..	..	..	3,023	..	..	..	..	..
1942 ..	..	..	..	..	3,096	402	..	..	..	..
1943 ..	..	..	..	..	3,071	411	223	..	..	..
1944 ..	..	..	..	..	2,728	354	180	107	..	..
1945 ..	..	..	..	..	2,685	277	162	103	102	..
1946 ..	2,381	204	198	139	2,922	264	155	115	85	73
1947 ..	2,376	277	169	155	2,977	263	143	105	90	77
1948 ..	2,292	214	201	149	2,856	296	162	103	80	62
Females.										
1941 ..	..	..	..	..	2,321	..	..	..	..	..
1942 ..	..	..	..	..	2,304	354	..	..	..	..
1943 ..	..	..	..	..	2,342	350	196	..	..	..
1944 ..	..	..	..	..	2,078	286	124	100	..	..
1945 ..	..	..	..	..	2,032	224	84	106	82	..
1946 ..	1,780	178	137	99	2,194	247	122	89	79	57
1947 ..	1,784	201	133	107	2,225	226	103	75	60	48
1948 ..	1,643	193	140	110	2,086	237	106	68	52	45

APPENDIX D.

SPECIAL PROCESSES ADOPTED FOR CALCULATION OF MORTALITY RATES AT INFANTILE AGES.

Age 0.—If the rate of mortality at age 0 be denoted by q_0 and the probability of dying in the first three months after birth be denoted by $q_0^{(0\text{–}3\text{ months})}$,

then $q_0 = q_0^{(0\text{–}3\text{ months})} + q_0^{(3\text{–}6\text{ months})} + q_0^{(6\text{–}9\text{ months})} + q_0^{(9\text{–}12\text{ months})}$,

where $q_0^{(0\text{–}3\text{ months})} = \dfrac{\text{Deaths in 1946, 1947 and 1948 (age 0–3 months)}}{\frac{1}{2}\beta^4\,1945 + \beta\,1946 + \beta\,1947 + \beta\,1948 - \frac{1}{2}\beta^4\,1948}$,

$q_0^{(3\text{–}6\text{ months})} = \dfrac{\text{Deaths in 1946, 1947 and 1948 (age 3–6 months)}}{\frac{1}{2}\beta^3\,1945 + \beta^4\,1945 + \beta\,1946 + \beta\,1947 + \beta^1\,1948 + \beta^2\,1948 + \frac{1}{2}\beta^3\,1948}$, etc.

and where $\beta\,1946$ represents the births in the year 1946,

$\beta^4\,1945$ represents the births in the fourth quarter of 1945, &c.

Ages 1–5.—For these ages the method employed in the construction of the latest National Tables for England and Wales was used, e.g.—

$$q_2 = \left\{\begin{array}{l}\text{Deaths at age 2–3 years in 1946, 1947 and 1948}\end{array}\right\} \div \left\{\begin{array}{l}\frac{1}{8}(\beta^1\,1943 + 3\beta^2\,1943 + 5\beta^3\,1943 + 7\beta^4\,1943) \\ \quad + \beta\,1944 + \beta\,1945 \\ \quad + \frac{1}{8}(7\beta^1\,1946 + 5\beta^2\,1946 + 3\beta^3\,1946 + \beta^4\,1946) \\ - \text{(deaths at age 0–1 in 1944, 1945 and 1946)} \\ - \text{(deaths at age 1–2 in 1945, 1946 and 1947)}\end{array}\right\}$$

By Authority: L. F. Johnston, Commonwealth Government Printer, Canberra.